

## SHELL COLLECTING ON THE MOSQUITO COAST OF NICARAGUA.—IV.

BY W. H. FLUCK.

*Strombus bituberculatus* Lam. Man of War Keys. Common.

*Cypræa exanthema* L. Same locality. A common shell on all the keys, including Great and Little Corn Island.

*Dolium perdix* L. Same locality.

*Pyrula papyratia* Say. Four dead shells on the beach near the mouth of the Wawa river.

*Polinices brunnea* Link. Wounta Haulover. Abundant.

*Polinices lactea* Guilding. Man of War Keys. Plentiful.

*Natica maroccana* Dillw. Wounta Haulover. Abundant.

*Crepidula plana* Say. Beach, north of Wawa river. One specimen.

*Crepidula convexa* Say. Beach, Wounta Haulover. Abundant.

*Janthina* sp? Although I tramped the beach nearly every evening for four years I found but two of these shells, but they were perfect, living specimens.

*Vermicularia spirata* Phil. Walpa Siksa. One shell.

*Litorina lineata* Phil. On the rock at Walpa Siksa. Plentiful in the dry season when no fresh water from the river entering the sea near the rocks disturbs them. Shells rather small, carinate and distinctly marked with the characteristic zigzag lines. I also have ten specimens from the Man of War Keys which are larger, less carinate and not so distinctly marked.

*Litorina columellaris* D'Orb. Wounta Haulover and everywhere on the beach along the whole coast. Invariably attached to stranded logs and pieces of wreckage. It often hollows out a pocket for itself in the decaying wood. This is the commonest litorine on the whole coast of Nicaragua.

*Litorina angulifera* Lam. This large and beautiful litorine is found along all the lagoons and rivers, hanging to mangroves beneath the surface of the water or not many feet above it. Specimens from Karata and Wounta. I never found it along the sea nor in fresh water up the rivers. It seems to prefer the brackish water "inside" not far from the sea. Very abundant.

*Tectarius muricatus* L. Man of War Keys. Plentiful.

*Cerithium literatum* Born. King's Keys. Abundant.

*Planaxis nucleus* Wood. King's Keys. Plentiful.

*Pachycheilus corvinus* Morel. Tungla river, near Quiquina, Nic. A common shell in all the rivers beyond the influence of the salt water. Dr. Pilsbry identified this shell for me, but Mr. Aucey, who received some of my shells from Mr. Shackelford, of Clitheroe, Eng., wrote me that my shells "differ from the true *P. corvinus* from Guatemala, named by the author himself." It was my intention to collect more of these shells, in order to supply my friends, but whenever I made preparation for a shell-collecting trip, some duty turned up and prevented me. At my request an Indian brought me about 100 specimens, and at first sight of them my heart rejoiced, but when I discovered that he had perforated the body-whorl of each, I rejected them in the hope of some day having opportunity to collect for myself. That time never came. The Indian's idea of shell collecting was limited to eating the inside and using the shells as beads! What an opportunity that would have been for lady shell-collectors!

*Ampullaria reflexa* Sw. Wounta. Found on the beach after heavy floods, just south of the river mouth at that place. Where they came from I do not know, presumably from "up the river." One had a perfect operculum, although a dead shell.

*Nerita peleronta* L.

*Nerita versicolor* Lam.

Both these forms from King's Keys and Man of War Keys. Much larger and more beautiful than those I have from the West Indies. A common article of food among the Indians, in turtle-spearing season, when they spend much time on the keys.

*Nerita tessellata* Gmel. Man of War Keys. Abundant.

*Nerita praecognita* C. B. Ads. Same locality. One specimen.

*Nerita fulgurans* Gmel. Walpa Siksa. On the rocks. Large. Not plentiful.

*Neritina lineata* Lam.

*Neritina lineata* var. *reticulata* C. & J. Common in Bluefields lagoon and in all the other lagoons and rivers as far up as the brackish water extends. The variety *reticulata* is by far the commoner of the two, only one in about forty being *lineata*. *Reticulata* averages larger, too. These shells are found on submerged mangrove roots and logs, or on the muddy bottom itself. The "tingnis," or channels, peculiar to the Mosquito Coast are its favorite haunts. It never ventures far from the water.

*Neritina virginea* L. On rocks and stones at the water's edge, inside the harbor, near the government wharf at Bluefields Bluff. As I made annual trips to Bluefields from my station at Wounta Haulover, I searched this spot and turned over the stones in April of 1899, 1900 and 1901, but saw none of these shells until May 5, 1902, when I found them in large quantities. The spot is about 200 yards from the sea, but in the rainy season is washed with fresh water for weeks. Have these shells been brought to Nicaragua by schooners from Grand Cayman or by fruit steamers from other ports? The shell is small, being about the size of *Neritina pupa* L., very uniform in its dark color and modest marking. It is very unlike the *N. virginea* I have seen from the West Indies.

*Astralium caelatum* Gmel. Man of War Keys. A very abundant shell on and about all the keys. An article of food among the Indians.

*Astralium americanum* Gmel. Same locality. Plentiful, but not as numerous as *caelatum*.

The Indians use the opercula of these shells for divination. By pouring strong banana vinegar over an operculum, the lime is eaten and gas liberated. This causes the operculum to "dance" about in one direction or another and in that way they find out the particular thing they want to know. No amount of explanation was able to convince them of their foolishness.

*Turbo filiosus* Fischer. Man of War Keys. I found only two or three dead shells.

(To be continued.)

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#### LIST OF WISCONSIN SHELLS.

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BY GEORGE HALCOTT CHADWICK.

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The following shells were collected in the summer of 1902 with the active assistance of the members of the Wisconsin Natural History Society, through whose bulletins a more complete annotated list will shortly be published. A thorough survey of the State is contemplated by the Society, for which this list will constitute a beginning. The specimens listed are all in the Milwaukee Public Museum.